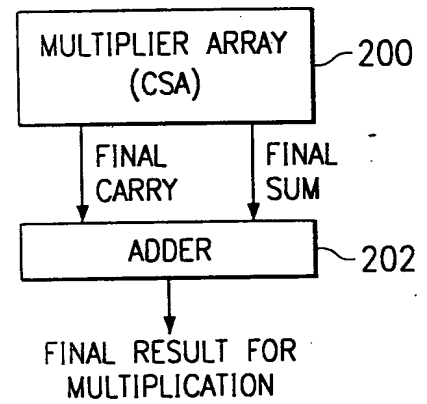
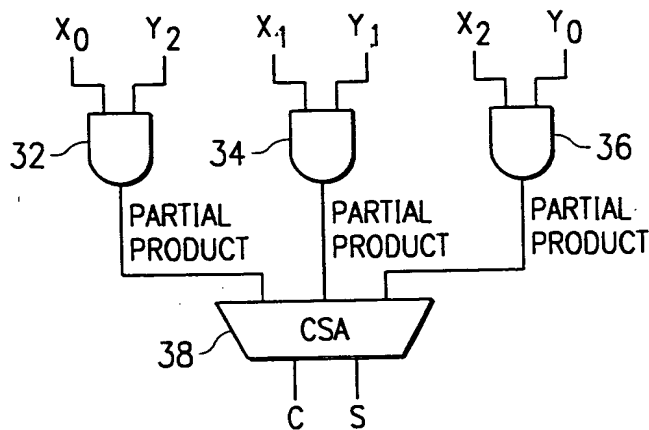
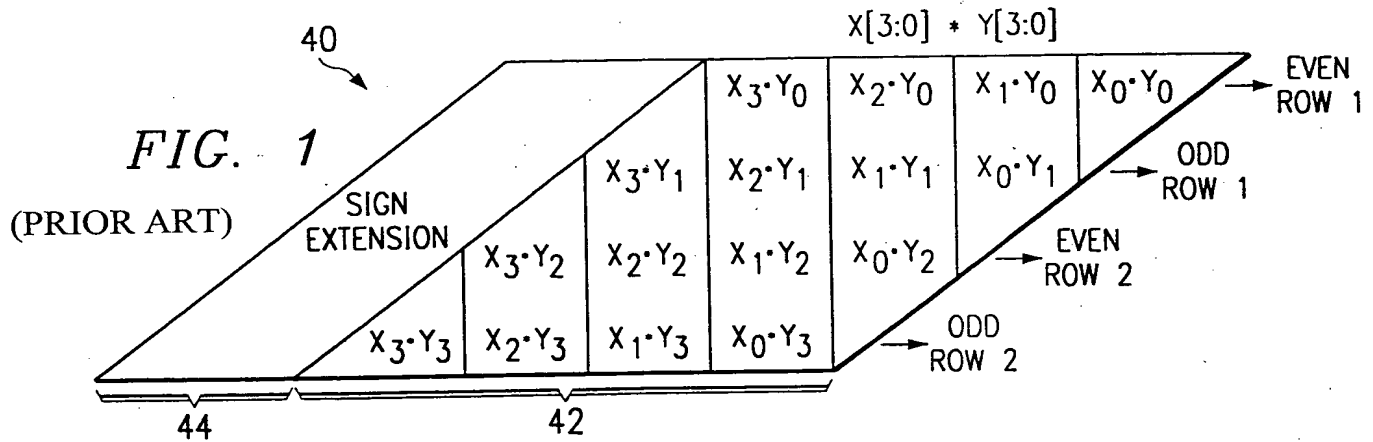


LINEAR SUMMATION MULTIPLIER ARRAY  
IMPLEMENTATION FOR BOTH SIGNED AND UNSIGNED  
MULTIPLICATION

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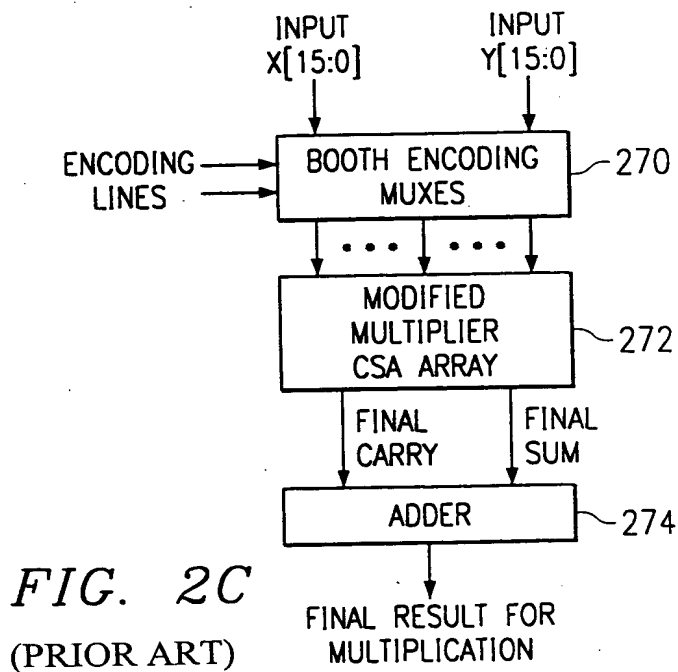
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**FIG. 2A**  
(PRIOR ART)

**FIG. 2B**  
(PRIOR ART)



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FIG. 3A

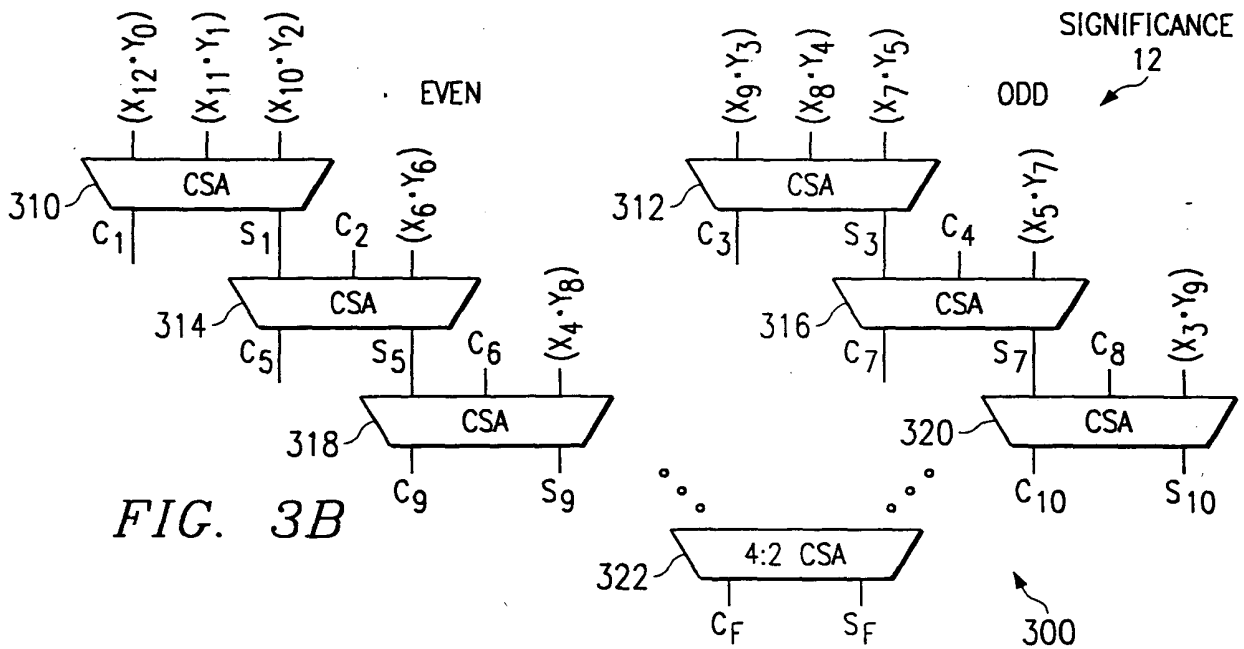
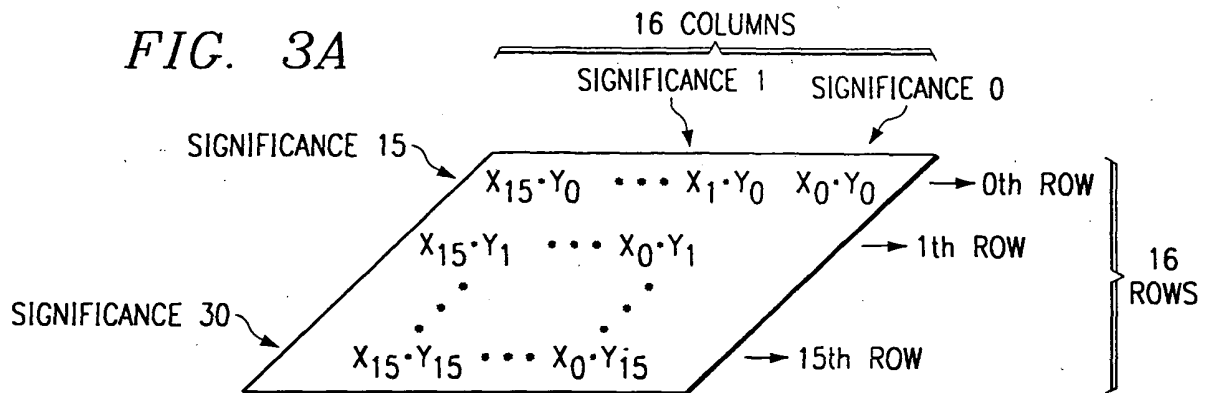


FIG. 3B

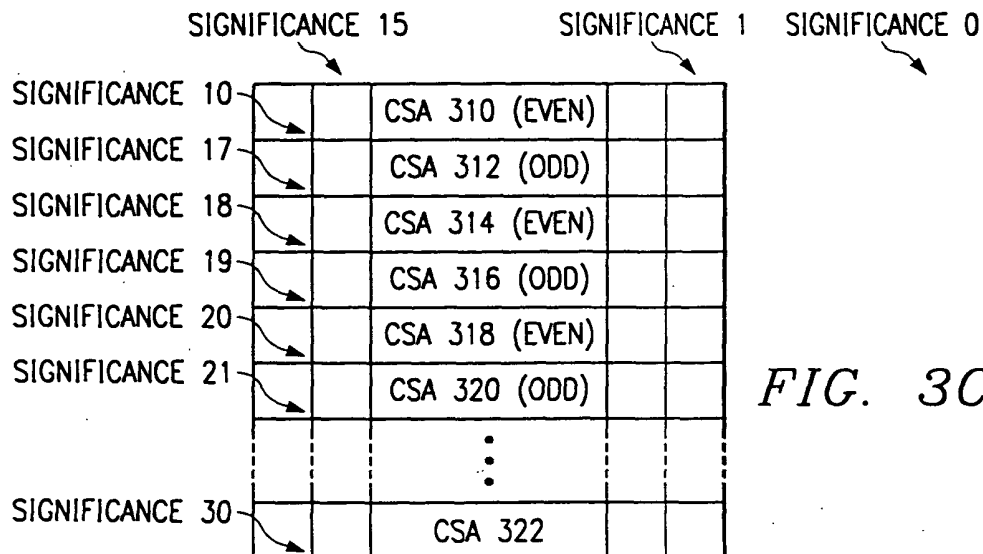


FIG. 3C

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$$A = S_A * (-1) * 2^{N-1} + \sum_{i=0}^{N-2} a_i * 2^i = S_A * (-1) * 2^{N-1} + A'$$

$$B = S_B * (-1) * 2^{N-1} + \sum_{i=0}^{N-2} b_i * 2^i = S_B * (-1) * 2^{N-1} + B'$$

$$\text{PRODUCT} = A * B = (S_A * (-1) * 2^{N-1} + A') * (S_B * (-1) * 2^{N-1} + B')$$

$$= \underbrace{S_A * S_B * 2^{2N-2}}_{\text{CORNER CELL}} + \underbrace{S_A * (-1) * 2^{N-1} * B'}_{A \text{ SIGN} * B'} + \underbrace{S_B * (-1) * 2^{N-1} * A'}_{B \text{ SIGN} * A'} + \underbrace{A' * B'}_{\text{ARRAY CORE}}$$

FIG. 4

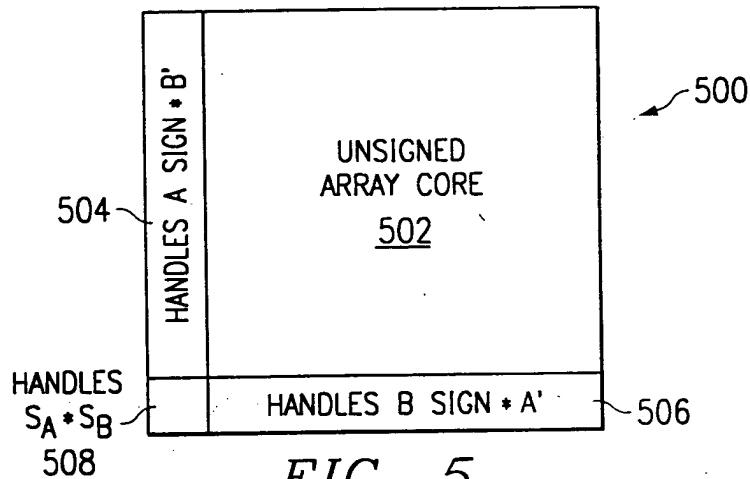


FIG. 5

CORNER BIT	S <sub>A</sub>	S <sub>B</sub>
0	0	0
1	0	1
1	1	0
1	1	1

$S_A + S_B = \text{CORNER BIT}$

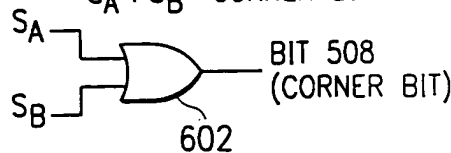


FIG. 6

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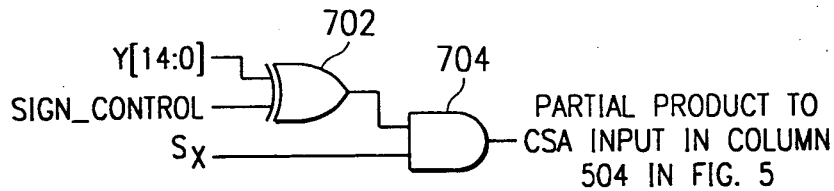


FIG. 7A

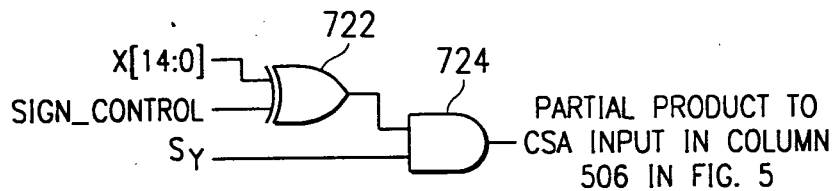


FIG. 7B

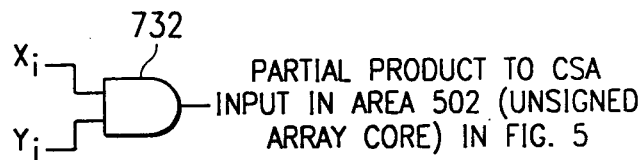


FIG. 7C

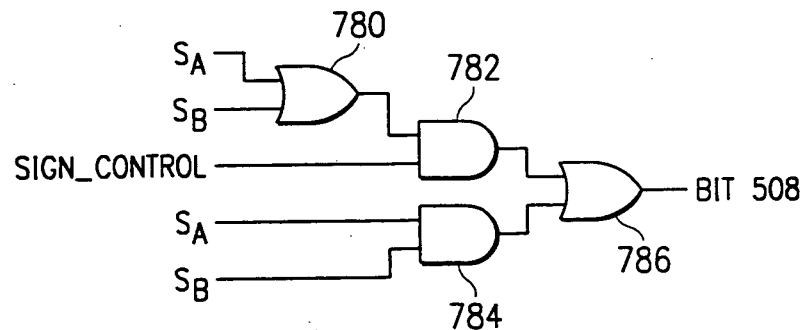


FIG. 7D

LINEAR SUMMATION MULTIPLIER ARRAY  
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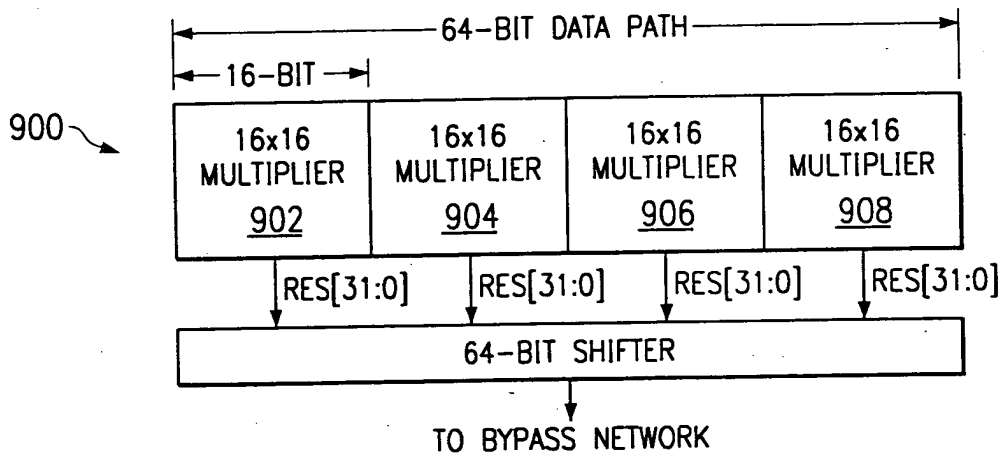
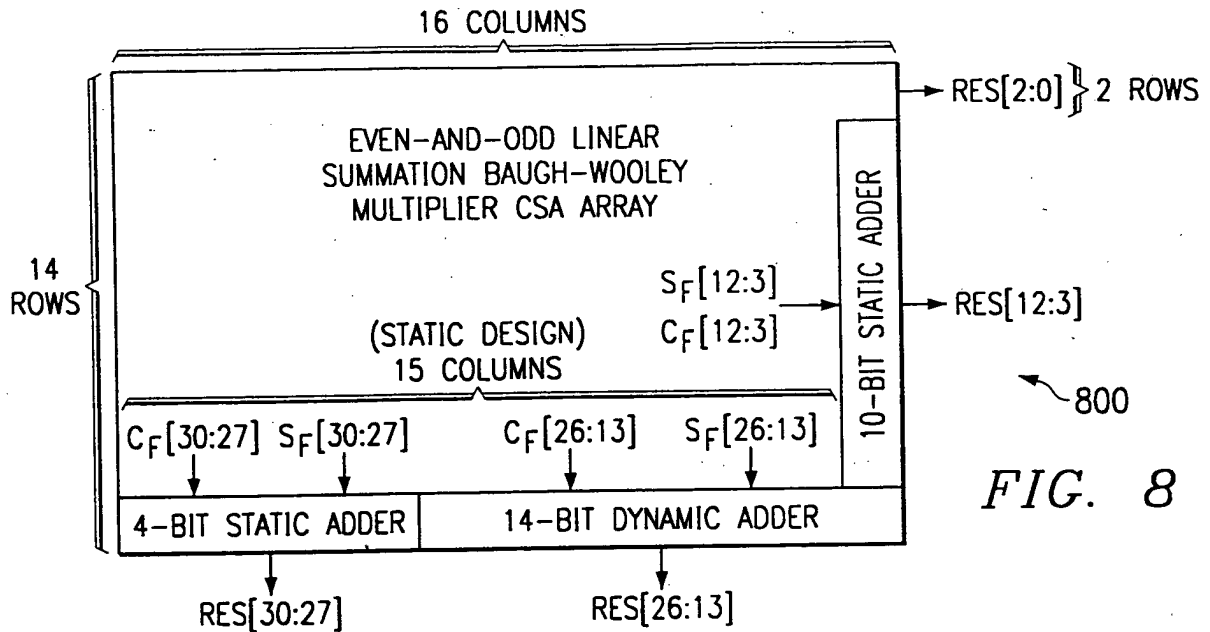
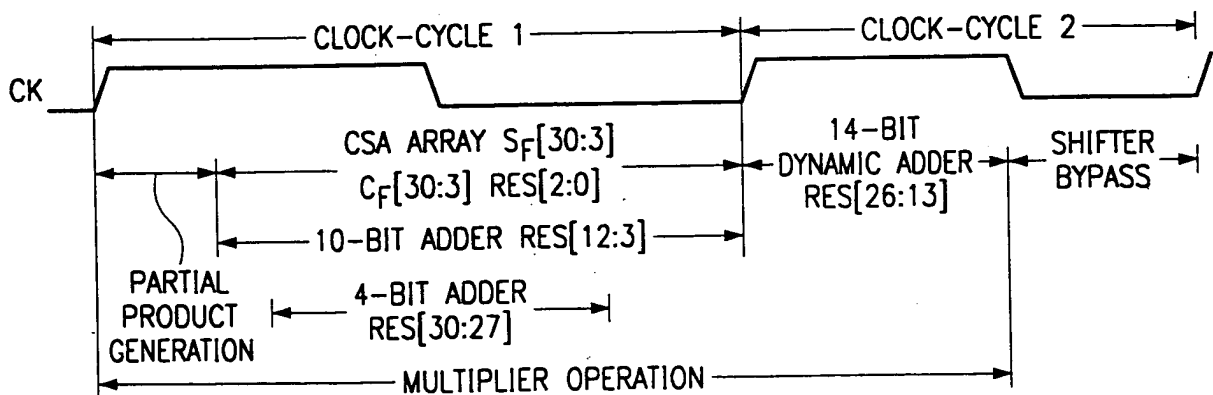


FIG. 9

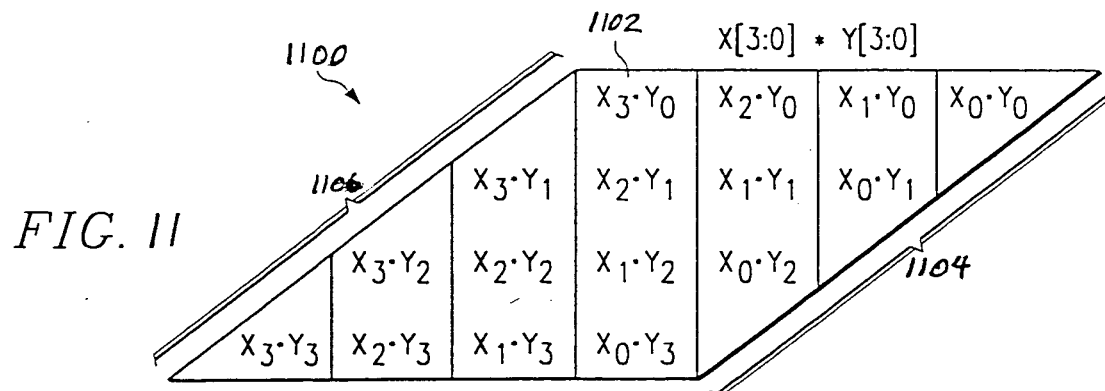


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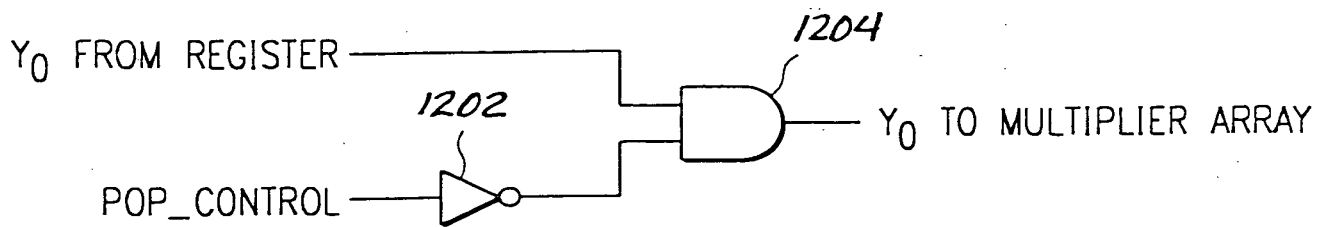


FIG. 12

LINEAR SUMMATION MULTIPLIER ARRAY  
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